

REMARKS

Claims 1-18 are pending in this application. Claims 1, 6, and 13 are cancelled. Claims 2-4, 6, and 14-15 are amended. No new subject matter is added. It is respectfully submitted that this Amendment is fully responsive to the Office Action dated June 30, 2005.

The Examiner objected to the title of the application. Applicants amend the title recite -- SEMICONDUCTOR DEVICE THAT CAN INCREASE THE CARRIER MOBILITY AND METHOD FOR FABRICATING THE SAME --. Accordingly, Applicants respectfully request that the Examiner withdraw this objection.

Claims 1 and 13 were rejected under 35 U.S.C. 102(e) as being anticipated by *Puchner et al* (USPN 6,544,854 B1). Applicants cancel claims 1 and 13. Accordingly, Applicants respectfully submit that this rejection is moot.

Claims 1 and 18 were rejected under 35 U.S.C. 102(e) as being anticipated by *Yagishita et al.* (USPN 6,815,279 B2).¹ Anticipation requires the presence in a single prior art reference the disclosure of each and every element of the claimed invention, arranged as in the claim.

Yagishita et al. fails to disclose a buffer layer of SiGe formed over a silicon substrate.

The *Yagishita et al* reference discloses a semiconductor device comprising a SiGe layer 12 buried in a silicon substrate 10 an Al gate electrode 17 formed over the silicon substrate 10 with a gate insulating film 15 formed between the silicon substrate 10 and the Al gate electrode 17 (*See Fig. 1A, and column 8, line 64 to column 9, line 6*).

¹ Applicants consider that "claim 1" in page 3, lines 13, 15 of the Office communication should read "claim 5".

Whereas, in the present invention, a buffer layer 40 of SiGe is formed over a silicon substrate 10. The buffer layer 40 is for providing a SiGe layer who lattice strain in an upper part thereof is substantially absent; although a silicon substrate 10 is used as a substrate.

Such a buffer layer 40 is neither disclosed nor suggested in *Yagishita et al.* The SiGe layer 12 of *Yagishita et al.* is buried in the silicon substrate 10 by ion implantation. The SiGe layer 12 of *Yagishita et al.* does not correspond to the buffer layer 40 of the present invention.

Yagishita et al. fails to disclose *a channel layer of silicon formed over the buffer layer, the channel layer having a thickness of 2 to 6 nm.*

For example, the *Yagishita et al.* reference discloses a tensile-strained Si channel layer 13 that exists in the silicon substrate 10. In *Yagishita et al.*, the tensile-strained Si channel layer 13 is formed by burying the SiGe layer 12 which does not correspond to the buffer layer 40 of the present invention. Also, the thickness of a tensile-strained Si channel layer 13 existing on the SiGe layer 12, in *Yagishita et al.*, is 2nm to 30 nm. Whereas, the thickness of the channel layer 18b in the present invention is 2 to 6nm. This, in part, makes it is impossible for the quantum confining effect to sufficiently occur. *Yagishita et al.* neither discloses nor suggests the quantum confining effect.

Also, since the channel layer 18b of silicon, in the present invention, is formed over the buffer layer of SiGe, it is possible to obtain a very precipitous profile of the Ge composition at the interface of the channel layer 18b and buffer layer 40. This, in part, allows the quantum confining effect to take place sufficiently in the channel layer 18b. *Yagishita et al.* neither

discloses nor suggests such feature of the present invention. In *Yagishita et al.*, since the Si-Ge layer 12 is buried in the silicon substrate 10 by ion implantation, the Ge composition at the interface of the Si-Ge layer 12 and the tensile-strained Si channel layer 13 is not precipitous.

In view of the above remarks, Applicants respectfully request that the Examiner withdraw the rejections of independent claims 5 and 18.

Claim 6 was rejected under 35 U.S.C. 103(a) as being unpatentable over *Puchner et al.* (USPN 6,544,854 B1) in view of *Wilting* (USPN 4,080,719). Applicants amend claim 6 to depend from allowable claim 2. Accordingly, claim 6 should likewise be allowable, in view of the above comments, by nature of dependency.

Claims 5 and 12 were rejected under 35 U.S.C. 103(a) as being unpatentable over *Yagishita et al.* in view of *Wilting*.² As claims 9 and 12 depend from claim 5, they should likewise be allowable, in view of the above comments, by nature of their dependency. Moreover, Applicants respectfully disagree with the Examiner's reasons for rejection for at least the following reasons.

As described above, the present invention is characterized in that a buffer layer 40 of SiGe is formed over a silicon substrate 10, a channel layer 18b of silicon is formed over the buffer layer 40, and the thickness of the channel layer 18b is 2 to 6nm. These references neither disclose nor suggest such feature of the present invention. Accordingly, in view of the

² Applicants consider that "claim 5" in page 5, lines 8, 10 of the Office communication should read "claim 9".

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amendments and remarks, Applicants respectfully request that the Examiner withdraw the rejections of claims 9 and 12.

Applicants appreciate the Examiner's indication that claims 2-4, 7, 8, 10, 11, and 14-17 would be allowable if rewritten in independent form to include all of the limitations of the base claims and an intervening claim. Accordingly, Applicants have rewritten claims 2-4 and 14-15 in independent form. In view of this, Applicants respectfully request that these claims be allowed.

For at least the foregoing reasons, the claimed invention distinguishes over the cited art and defines patentable subject matter. Favorable reconsideration is earnestly solicited.

Should the Examiner deem that any further action by applicant would be desirable to place the application in condition for allowance, the Examiner is encouraged to telephone applicant's undersigned attorney.

If this paper is not timely filed, Applicant respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,

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